

PreCalc

3.4 Solving Exponential and Logarithmic Equations

Name: _____

Date: _____

Directions: Follow the directions for each section. Show any work on a separate sheet of paper.

I. Solve the following exponential equations. Round to three decimal places.

1. $10^x = 42$

2. $80 e^{-1/2} + 20 = 70$

3. $\frac{1}{3} 10^{2x} = 12$

4. $e^x = 6500$

5. $3(10^{x-1}) = 2$

6. $3^x = 3^{x^2-2}$

7. $3^{2x} = 80$

8. $\left(\frac{1}{4}\right)^x = 64$

9. $2^{3x} = 565$

10. $4^{x^2} = 100$

11. $1000 e^{-4x} = 75$

12. $3(1 + e^{2x}) = 4$

13. $12^x = 4^{x-2}$

14. $20(100 - e^{x/2}) = 4$

15. $2^{x+1} = 5^{x-3}$

II. Solve the following logarithmic equations. Round to three decimal places.

16. $\ln x = 5$

17. $\log 2 + \log x = 3$

18. $2 \ln x = 7$

19. $\log x - \log 3 = 15$

20. $2 \ln 4x = 0$

21. $\log (x + 4) - \log 4 = \log (x + 2)$

22. $\log (z - 3) = 2$

23. $\log x - \log (2x - 1) = 0$

24. $\ln 2x = -1$

25. $\ln x + \ln (x + 3) = 1$

26. $3 \ln 5x = 10$

27. $\log_2 (x + 5) - \log_2 (x - 2) = 3$

28. $6 \ln (x + 1) = 2$

29. $\log_4 x + \log_4 (x - 2) = 3$

30. $\log x^2 = 20$